



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : A01K 31/07		A1	(11) International Publication Number: WO 92/06590 (43) International Publication Date: 30 April 1992 (30.04.92)
<p>(21) International Application Number: PCT/US91/07263</p> <p>(22) International Filing Date: 9 October 1991 (09.10.91)</p> <p>(30) Priority data: 594,923 10 October 1990 (10.10.90) US</p> <p>(71) Applicant: THE UNITED STATES OF AMERICA, represented by THE SECRETARY, UNITED STATES DEPARTMENT OF COMMERCE [US/US]; Washington, DC 20231 (US).</p> <p>(72) Inventors: MASON, Robert, Thomas ; 3930 N.W. Witham Hill, #113, Corvallis, OR 97331 (US). PANNELL, Lewis, Kenneth ; 11413 Catalina Terrace, Silver Spring, MD 20902 (US). HOYT, Robert, Franklin, Jr. ; 14501 Chrisman Hill Drive, Boyds, MD 20841 (US).</p>		<p>(74) Agents: OLIFF, James, A. et al.; Oliff & Berridge, P.O. Box 19928, Alexandria, VA 22320 (US).</p> <p>(81) Designated States: AT (European patent), AU, BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent).</p> <p>Published <i>With international search report.</i></p>	
<p>(54) Title: CAGE CONFIGURATION FOR ARBOREAL REPTILES</p> <p>(57) Abstract</p> <p>A cage for arboreal animals includes two compartments (12, 14), each having a hinged, latched, door (16, 18). The two compartments (12, 14) are separated by a sliding panel (28) to enable maintenance to be performed easily and safely, minimizing unwanted contact between hazardous animals, such as venomous snakes, for example, and the investigators or maintenance personnel. The structure is further ventilated to provide air flow from bottom to top, and could maintain a humidity level in accordance with needs of cage animals. The sides of the cage are transparent to permit simple monitoring of the reptiles as well as to meeting the social needs of those animals in adjacent cages. The cage meets or exceeds all current Federal principles and regulations for animal housing units.</p>			

-1-

CAGE CONFIGURATION FOR ARBOREAL REPTILES

TECHNICAL FIELD

This invention relates to animal housing units, and more particularly to improved cages for promoting the maintenance of a high humidity environment therein, if required by arboreal animals including mammals, birds, reptiles and particularly snakes. This invention further includes structural features to: a) minimize disturbances to the housed animals during daily maintenance and cleaning of the cage and b) for improving the safety of an investigator by isolating the animal from the investigator during such maintenance.

BACKGROUND ART

Both mammalian and non-mammalian species are used in biomedical research today. For various reasons, however, in recent years there has been increasing use of non-mammalian species. In 1985, the National Academy of Sciences issued a report describing the increasing trend in the use of non-traditional models for biomedical research (as reported by the Committee on Models for Biomedical Research in Models for Biomedical Research: A New Perspective, National Academy Press, Washington, DC, 1985). More recently, an in-depth discussion on the use of new models was given by Woodhead et al. in Nonmammalian Animal Models for Biomedical Research, CRC Press, Boca Raton, 1989. The description of nonmammalian animal model alternatives used in biomedical research emphasizes the emerging utility of these species with their specialized attributes. The species include fish, amphibians, birds and reptiles.

Reptiles (and more specifically arboreal reptiles) have recently emerged as animal models of considerable interest and potential. Although reptiles have not been commonly reported in previous biomedical literature, this status is changing, as may be noted by recent publications such as Callard I., ed. Unconventional Animal Models in Endocrine Research, Journal of Experimental Zoology 1990; In press and Greenberg N., Burghardt G.B., Crews D., Font

- 3 -

the Guide for the Care and Use of Laboratory Animals, Committee on Care and Use of Laboratory Animals, Institute of Laboratory Animal Resources, National Research Council, National Institutes of Health, Bethesda, MD. DHEW Publication No. 85-23, 1985, as its interpretation of animal care and use activities, including caging, animal social environment, and provides guidelines for appropriate macro and micro environments such as temperature, humidity, ventilation, illumination and the like.

10 Th Guide was prepared for the more traditionally used laboratory animals in biomedical research such as dogs, cats, rodents, rabbits and non-human primates. Accordingly, the Guide does not specifically provide appropriate guidance for caging reptiles, and other non-mammalian vertebrates.

15 Because reptiles are vertebrates (i.e., they possess a backbone) appropriate caging for these species must be in accordance with the general principles identified in the Guide. Caging should be designed to meet 20 research requirements, facilitate animal well-being and minimize experimental variables. The cage should, moreover, be appropriate in size for the species being housed and should be designed with the safety of both the animal and the handler taken into consideration.

25 Specifically, the Guide calls for caging to provide space that 1) is adequate and comfortable; 2) provides an escape-proof enclosure that confines animals safely; 3) provides easy access to food and adequate ventilation; 4) meets the biological needs of the animals 30 including maintenance of body temperature, urination, defecation, and reproduction; 5) keeps the animals dry and clean; 6) avoids unnecessary physical restraint, and 7) protects the animals from hazards.

35 From a practical and versatile point of view, the cage should be mobile and be constructed of sturdy, durable materials and should be designed to minimize cross-infection between adjoining units. Moreover, the cost and ease of construction should be balanced with

- 5 -

this ability to sanitize is mandatory.

Various other cages are described in the patent literature as follows.

U.S. Patent 3,815,549 to Opmeer discloses a bird cage having a pair of separable sections joined by an intermediate section, the sections being separable to improve maintenance. However, such a three-section cage is more difficult to construct and includes an open section at the top, thus failing to meet objectives for an all purpose housing apparatus.

U.S. Patent 4,763,607 discloses a pet animal cage which includes clear plastic sides and a removable lid secured to the plastic sides by hook means. Suction cups are used to maintain the lid on the base. The cage is indicated as being useful for animals including snakes and lizards.

U.S. Patent 4,526,133 to LoMaglio discloses an animal isolation cage ward which has a perforated metal top. The disclosed device provides upper and lower confinement units and separate doors, of transparent material, for each confinement unit. However, the device is intended primarily for use with small laboratory animals having infectious diseases and is intended for isolating the animals from one another. Accordingly, there is no provision for airflow from one unit to the other. Indeed, the two portions of the cage are two separate units rather than two portions of a single confinement unit separated by a slidable partition.

U.S. Patent 4,480,587 discloses an animal cage utilizing a perforated metal top.

U.S. Patent 3,225,738 discloses an animal cage and support which is provided with a removable floor divider as shown in Figure 6.

Thus, none of the prior art teaches or suggests an acceptable cage for arboreal animals which meets or exceeds the various requirements for cages for arboreal animals, whether the requirements are established by regulation or by safety considerations, and the like.

- 7 -

to one compartment while the caged animal is secured in the other compartment, without danger to the maintenance or investigative personnel.

In accordance with the foregoing and other objects 5 of the invention, there is accordingly provided a cage assembly for retaining an animal including first and second compartments. The compartments have walls of substantially identical material and respective first and second doors. The compartments substantially adjoin each 10 other and are in open communication with each other. A panel separates the first and second compartments and selectively isolates the compartments from one another, thereby simplifying maintenance of the cage assembly by permitting isolation of a caged animal in one of the 15 compartments while permitting maintenance tasks to be performed in the other of the compartments, thus eliminating the possibility of harmful contact between the animal and the maintenance person.

Preferably, the compartments each include transparent 20 walls for permitting an observer to monitor the animal caged therein.

In accordance with one aspect of the invention, the compartments are vertically displaced from one another. In this embodiment, the door provided for the 25 lower one of the two compartments includes ventilating openings. Moreover, the cage assembly includes a roof panel on an upper portion of the upper compartment, the roof panel including second ventilating openings therein. This arrangement advantageously enables ventilating air to 30 flow from bottom to top of the cage.

In accordance with another aspect of the invention, the first and second compartments are adjoining located and are horizontally displaced from one another. In this embodiment, at least one of the first and second 35 doors includes the ventilating openings in a lower portion thereof, and the roof panel includes the second ventilating openings therein, over at least one of the first and second compartments, thus maintaining the

- 9 -

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, incorporated into and forming a part of the specification, illustrate several aspects of the present invention and, together with the 5 description, serve to explain the principles of the invention. In the drawings:

Figure 1 shows a preferred embodiment of the invention in perspective view;

10 Figure 2 shows a detail of the embodiment of Figure 1, highlighting a sliding panel used therein; and

Figure 3 shows an alternative embodiment of the invention, wherein the compartments are displaced horizontally relative to each other.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

15 Referring now to Figures 1 and 2, there is shown a preferred embodiment of the invention wherein a cage assembly is generally identified by reference numeral 10. The inventive assembly includes a first compartment 12, mounted vertically above a second compartment 14.

20 As is seen from the drawing, each compartment includes a separate door. Compartment 12 is closed by a door 16 and compartment 14 is closed by a door 18. The doors are shown as sufficiently wide to permit passage therethrough of any object or reptile which may fit within 25 the compartments. Particularly, each door is seen to comprise an entire wall section of the respective compartment. Of course, the doors may be smaller than the size of an entire respective wall section without departing from the scope of the invention.

30 Doors 16 and 18 are each hinged at one end and latched at another end. Thus, door 16 is hinged on hinges 20 and is latched by latches 22, while door 18 is hinged on hinges 24 and latched by latch 26.

35 A sliding panel 28, shown withdrawn in Figure 2, separates the two compartments 12 and 14 one from the other. Panel 28 slides on a track structure 30 provided on the interior surface of the cage assembly. The track structure may be in one or the other of the two

- 11 -

cage to be steam autoclaved, as needed for sanitation purposes.

The top of the cage is formed of a sheet of 1/16 inch perforated stainless steel, type 304, fastened to the upper Plexiglas roof panel 34 by eight #10 thumb screws 38. The ventilation holes 32 in the bottom door 18 are arranged at 1.5 inch spacing center to center, for holes having 1/2 inch diameters. A fine nylon mesh screen 40 is affixed to the inside surface of the bottom door.

The sliding panel 28 is formed of aluminum, and track structure 30 is formed of a set of 1/4 inch by 1/4 inch Plexiglas strips to serve as a track for the aluminum panel which separates the top half of the cage, compartment 12, from the bottom half thereof, compartment 14.

To enhance portability of the cage structure, there are provided two aluminum lifting handles on each side (one such handle 42 being shown in Figure 1), so that the cage may be moved by one or two persons.

Referring now to Figure 3, there is shown an alternate embodiment of the invention. As illustrated therein, the cage assembly may alternatively have horizontally displaced compartments. Thus, as shown in the Figure, the cage assembly, generally identified by reference numeral 110, includes a first compartment 112, mounted horizontally to the left of a second compartment 114.

As is seen from the drawing, each compartment includes a separate door. Compartment 112 is closed by a door 116 and compartment 114 is closed by a door 118. Although not drawn to include all the details of Figure 1, since the same structural features are generally to be included in both embodiments, the doors of the alternate embodiment of Figure 3 may be sufficiently wide to permit passage therethrough of any object or reptile which may fit within the compartments. As with the embodiment of Figure 1, each door may comprise an entire wall section of the respective compartment.

Doors 116 and 118 are each hinged at one end

- 13 -

a track for the aluminum panel which separates the two compartments 112 and 114.

The top of the cage is formed of a sheet of perforated stainless steel, fastened to the upper 5 Plexiglas roof panel 134 by a number of fasteners (not shown). A fine nylon mesh screen (not shown) may be affixed to the inside surface of the doors at the ventilation openings 132. Aluminum lifting handles 142 are provided on each side.

10 There have thus been described two embodiments of the invention, which provide a cage design for arboreal reptiles addressing various regulatory and safety criteria and which may be used for housing venomous or aggressive species. Upon experimentation with the embodiment of 15 Figures 1 and 2, it has been found that the various research requirements therefor are all met. The structure further meets all current federal caging principles and requirements for the appropriate animal housing of laboratory animals.

20 The cage may be either sterilized either by autoclaving (if constructed of Lexan®), or by placing in an ethylene oxide sterilizer. The cage may be sanitized with hot water and antiseptic soap. Adequacy of ventilation provided by the cage structure is demonstrated 25 by the lack of any persistent remanent odors in the cage. In use, it has been found that daily spraying of the inside surfaces of the cage walls is sufficient to maintain the high humidity required by the subjects. The clear sides used in the cage structure have been 30 visualization of animal behavior straightforward. The transparent panels further contribute to the continuing efforts to monitor the animals' health status visually, without engendering any additional stress by frequent handling.

35 More ver, the animal behavior may be videotaped by a camera situated remotely from the cage, further minimizing disturbance to the animals.

In studying the chemical ecology of the Guam brown

- 15 -

WHAT IS CLAIMED IS:

1. A cage assembly for retaining an animal, comprising:

5 first and second compartment sections structured of wall portions of substantially identical material, said first and second compartment sections located substantially adjoining each other and in open communication with each other;

10 panel means for separating said first and second compartment sections in selectively isolating said compartment sections from one another and simplifying maintenance of the cage assembly by permitting isolation of a caged animal in one of said first and second compartment sections while performing maintenance tasks in the 15 other of said compartment section without a possibility of contact between the animal and a person performing said maintenance tasks; and

first and second doors respectively provided for said first and second compartment sections.

20 2. A cage assembly as recited in claim 1, wherein said first and second compartment sections each include transparent walls for permitting an observer to monitor an animal caged therein.

25 3. A cage assembly as recited in claim 1, wherein said compartment sections are adjoiningly positioned vertically displaced from one another and wherein;

30 said first door is provided for the lower positioned compartment section, said first door including first ventilating openings therein;

35 further comprising a roof panel on an upper portion of an upper positioned compartment section, said roof panel including second ventilating openings, thereby enabling ventilating air flow between compartments of said cage assembly in order to maintain high humidity for a reptile caged therein.

4. A cage assembly as recited in claim 3 wherein said second door is provided for the upper positioned

- 17 -

at least one of said first and second compartment sections to provide portability to said cage assembly.

11. A cage assembly for retaining an animal, comprising:

5 first and second compartment sections structured of wall portions of substantially identical material, said first and second compartment sections located substantially adjoining each other horizontally displaced from one another and in open communication with
10 each other;

15 panel means for separating said first and second compartment sections in selectively isolating said compartment sections from one another and simplifying maintenance of the cage assembly by permitting isolating of a caged animal in one of said first and second compartment sections while performing maintenance tasks in the other of said compartment section without a possibility of contact between the animal and a person performing said maintenance tasks; and

20 first and second doors respectively provided for said first and second compartment sections.

25 12. A cage assembly as recited in claim 11, wherein said first and second compartment sections each include transparent walls for permitting an observer to monitor an animal caged therein.

30 13. A cage assembly as recited in claim 11, wherein at least one of said first and second doors including first ventilating openings in a lower portion thereof;

35 further comprising a roof panel on an upper portion of the cage assembly, said roof panel including second ventilating openings over at least one of said first and second compartment sections thereby enabling ventilating air flow, between compartments, to top of said cage assembly in order to maintain high humidity for an animal caged therein, as necessary.

14. A cage assembly as recited in claim 13, wherein said first and second doors are substantially

- 19 -

at least one of said first and second compartment sections
to provide portability to said cage assembly.

2/2

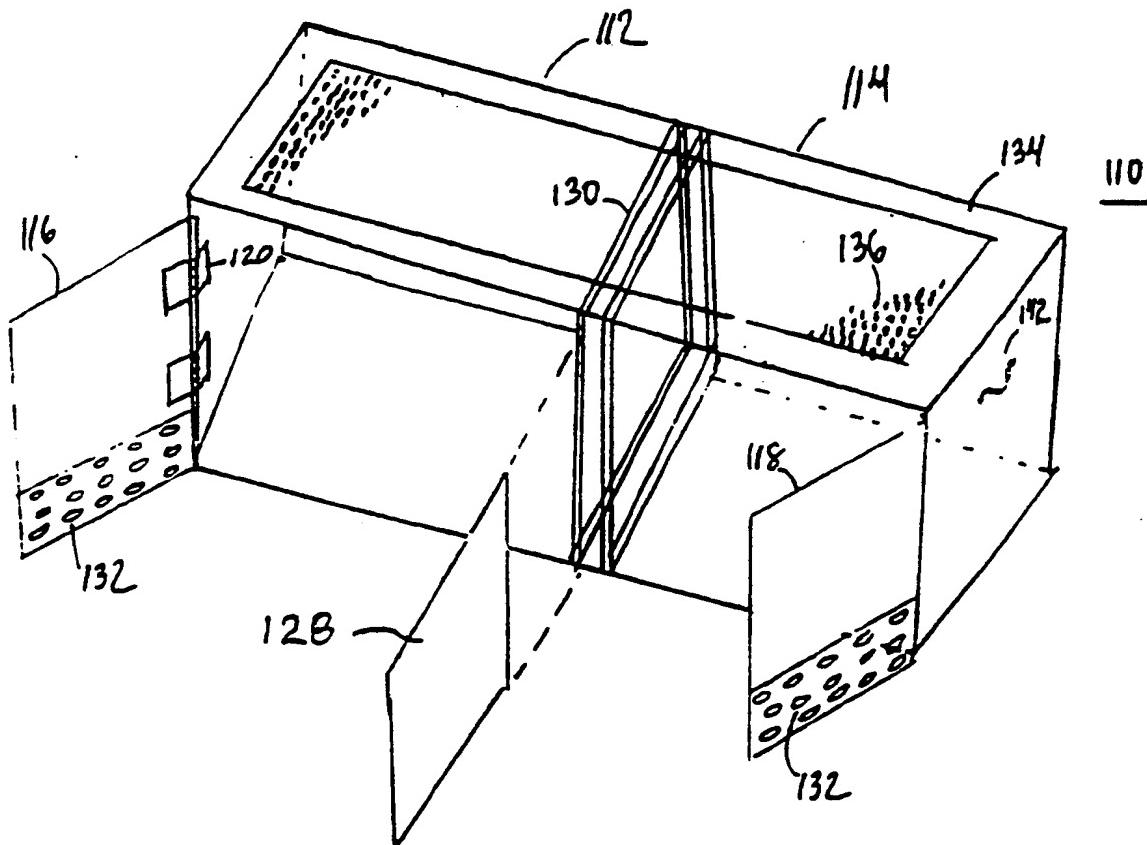


FIG. 3